The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of controlling the equivalence ratio in an internal combustion engine to improve three way catalytic converter performance comprising:

varying an equivalence ratio setpoint between a rich and a lean state periodically; [and]

introducing a fuel enrichment pulse in the internal combustion engine to the equivalence ratio that sweeps the equivalence ratio across stoichiometry to clean sulfur from the three way catalytic converter; and

wherein the fuel enrichment pulse is controlled to clean the Ce02 elements in the three way catalytic converter.

2. (original) The method of Claim 1 wherein the step of varying an equivalence ratio setpoint between a rich and a lean state characterized as a periodic function comprises varying the equivalence ratio between 0.9 and 1.1.

3. (original) The method of Claim 1 wherein the magnitude of the fuel enrichment pulse at least enriches the equivalence ratio by 0.1.

4. (previously presented) The method of Claim 1 wherein the fuel enrichment pulse is added periodically based upon the rate of sulfur poisoning of the three way catalytic converter.

5. (original) The method of Claim 1 further comprising determining the equivalence ratio of the internal combustion engine using an oxygen sensor.

6. (original) The method of Claim 5 wherein said oxygen sensor generates a discrete signal.

7. (currently amended) A method of controlling equivalence ratio in an internal combustion engine having a three way catalytic converter comprising:

dithering the equivalence ratio about an equivalence ratio setpoint;

controlling the equivalence ratio with an oxygen sensor; [and]

periodically introducing a fuel enrichment pulse in the internal combustion engine to sweep the equivalence ratio across stoichiometry to remove sulfur from the three way catalytic converter;

wherein said fuel enrichment pulse is optimized to clean oxygen storage sites in said three way catalytic converter; and

wherein said oxygen sensor is a discrete switching oxygen sensor.

8. cancelled

9. (original) The method of Claim 7 further comprising determining the equivalence ratio of the internal combustion engine using an oxygen sensor.

10. (original) The method of Claim 7 wherein said oxygen sensor generates a discrete signal.

11. (original) The method of Claim 10 wherein said oxygen sensor generates an analog signal.

12. (previously presented) An engine control system for an internal combustion engine comprising:

a fuel injector for introducing fuel into the internal combustion engine;

a controller for controlling the amount of fuel injected into the internal combustion engine by said fuel injector;

an exhaust manifold coupled to said internal combustion engine;

a catalytic converter coupled to said exhaust manifold; and

wherein said controller dithers the equivalence ratio about stoichiometry and introduces a fuel enrichment pulse to periodically sweep the equivalence ratio across stoichiometry, said fuel enrichment pulse introduction based upon the rate of sulfur reaction with the catalytic converter.

13. (original) The system of Claim 12 wherein said internal combustion engine is an overhead valve engine.

14. (original) The system of Claim 12 wherein said internal combustion engine is an overhead cam engine.

15. (original) The system of Claim 12 wherein said internal combustion engine is a rotary engine.

16. (original) The system of Claim 12 wherein said catalytic converter is a three-way catalytic converter.

17. (previously presented) The system of Claim 12 wherein said sulfur is removed from cerium molecules in the catalytic converter.